



# Plot Plan Requirements for One & Two Family Residential Dwellings

*Rick Kaufmann, P.E.*

*Engineer, Building & Site Development*

*City of Columbia Community Development Department*

*701 E. Broadway*

*P.O. Box 6015*

*Columbia, MO 65205-6015*

*[Rick.Kaufmann@CoMo.gov](mailto:Rick.Kaufmann@CoMo.gov)*

*Phone: (573) 874-7575*



# Outline

- Purpose of Plot Plans
  - How City Staff Processes & Uses Plot Plans
  - Problems with Current Requirements
    - Examples
  - Upcoming Changes and Feedback We Received
- 
- New Requirement for Demolition Permits

# Purpose of Plot Plans

- Site Grading plans cover the entire development, and are prepared and approved before the site is graded or developed.
- Plot plans cover only one lot. They are drawings which show the location of existing and proposed improvements in relation to property boundaries and roadways. Plot plans should also show all of the pertinent information from the Site Grading plan that applies to the particular lot being built on.

# Purpose of Plot Plans

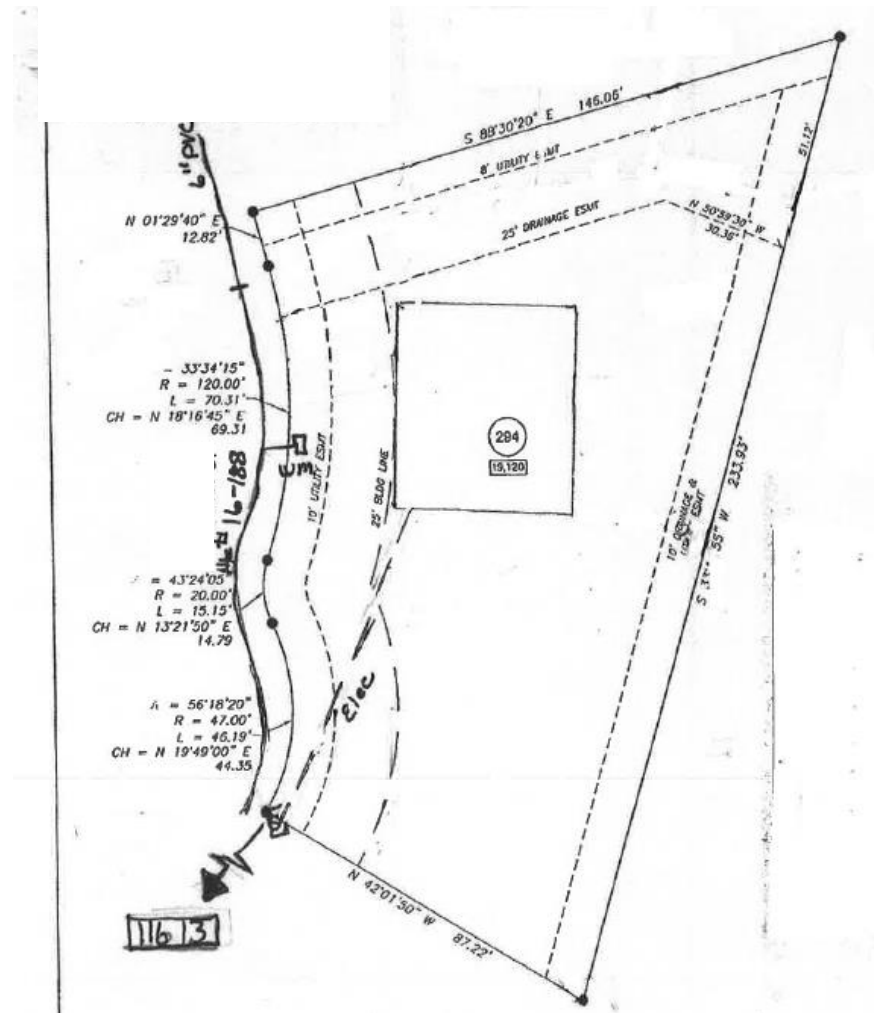
- Everyone's mutual goal: A residential lot that has correctly installed infrastructure, and is graded properly to work with the overall grading plan, and drains as designed.
  - This resident will never call the city, the builder, or the developer with drainage or flooding problems.
  - Homeowners have a reasonable expectation that there will not be drainage or other issues on their lot they've invested heavily in.



# How City Staff Currently Processes and Uses Plot Plans

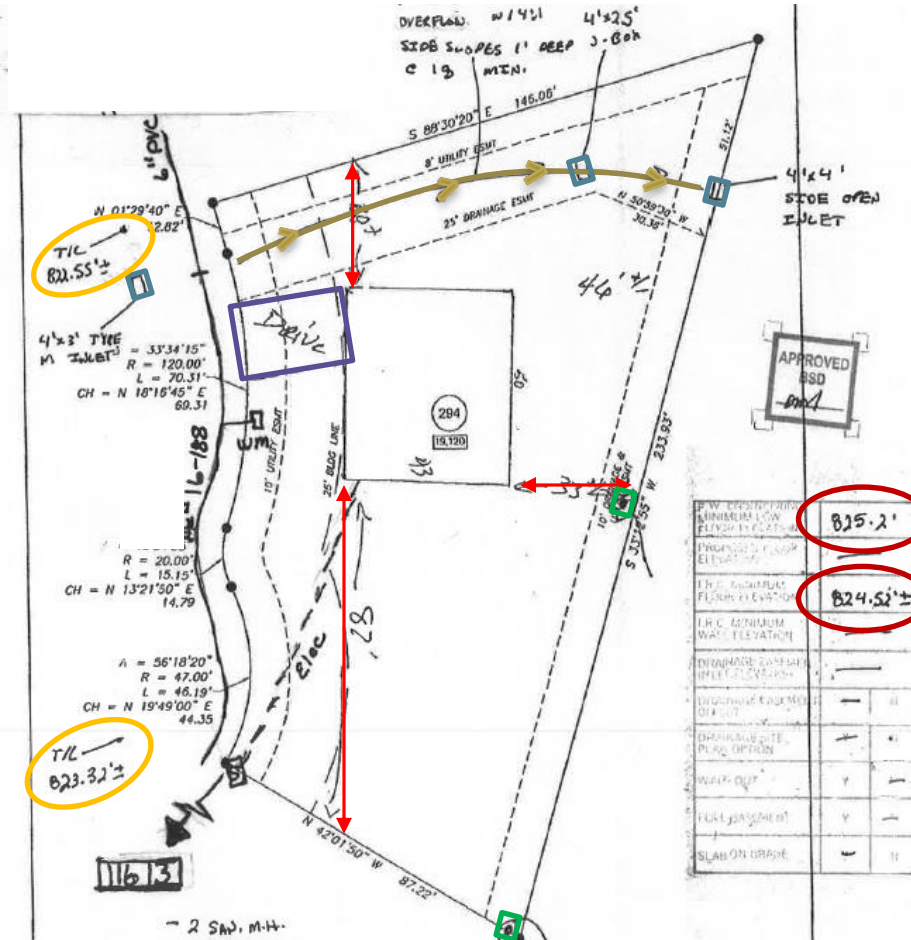
- When plot plans are submitted, important information is often omitted. (Swales, elevations, location of drainage and sewer structures, etc.) City staff looks up information from the approved grading plans and adds to the plot plan.
- Site inspectors verify field conditions match the plot plan.

# Example Plot Plan as Submitted



- Note: The handwritten information is in regards to the utility hookups and was added by Water and Light Dept.

- Note the critical information that the builder was presumably not aware of, that was added by city staff.



# Problems with Current Requirements

- The site engineer spent much effort designing the Site Grading and Stormwater plans. Swales and storm infrastructure were designed, elevations were carefully thought out, etc.
- City plan reviewers spent much effort reviewing, ensuring all requirements were met.
- Often home builders do not seem to be aware of the Site Grading plan & requirements for their lot.
- City staff must add critical missing information to plot plans.



# Problems with Current Requirements

Issues we are having with residential building sites:

- A walkout home on a lot that was designed for a slab home.
- Incorrect low finished floor elevations.
- Lots not graded per the approved grading plan, affecting adjacent lots.
- Storm and sanitary structures not placed at correct elevation.
- Engineered swales not installed at correct location/elevation.
- Driveways conflicting with curb inlets.

*Elevation issues are compounded by not having an as-built street plan.*

# Not to mention:

- Lots are getting narrower.
- Subdivisions are being developed on steeper terrain.
- Thus, deviations from design elevations are a more serious issue. The margin for error is much smaller than it has been in the past.

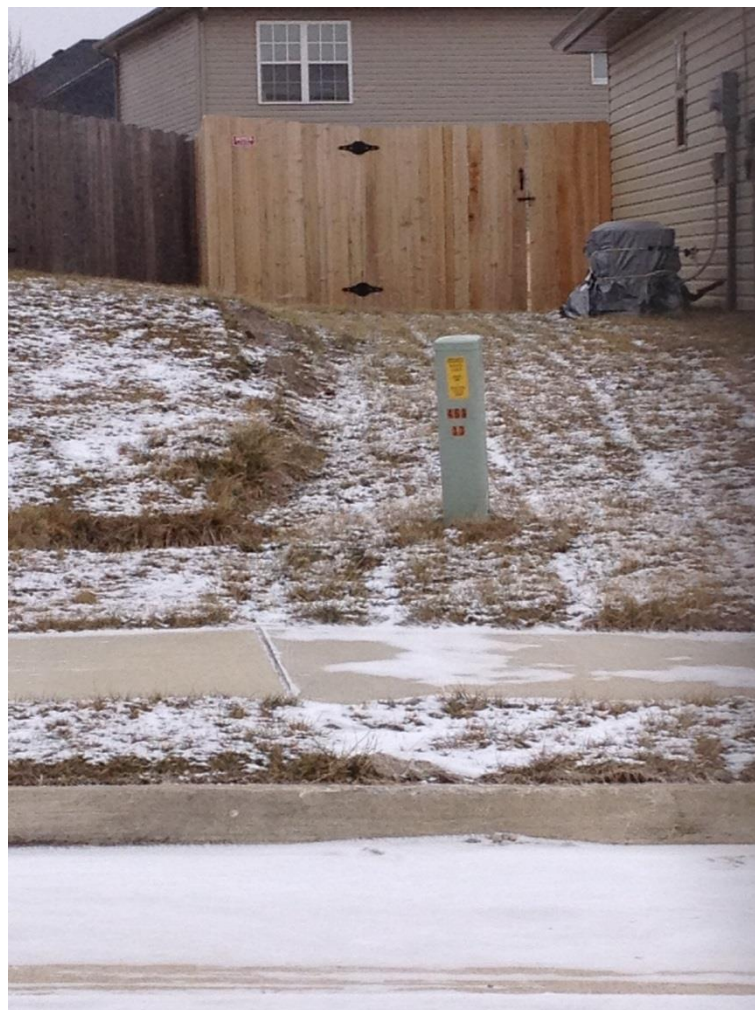


## In summary:

- Too often, site grading, finished floor elevations, and the like are selected without knowledge of the approved Site Grading plan for the overall development.
- Even with the missing info added to the plot plan by City staff, too often the grading/ drainage for the lot does not end up as designed.
- End result? Failed yard finals, re-designs, delays, unhappy homeowners with hard-to-fix drainage problems.

# Examples



























# Changes to Plot Plan Requirements

- Building and Site Development determined that requirements for plot plans needed updating.
- Several meetings were held with those who process plot plans in the office, site inspectors, and BSD management.
- As we'll discuss later, we also asked for feedback from outside engineers and contractors.



# Changes to Plot Plan Requirements

- Based on feedback we received, we're phasing the changes in: New requirements will apply to lots within plats approved after October 1, 2016.

# Changes to Plot Plan Requirements

For plot plans that fall under the new requirements:

- Plot plans with incomplete information will not be processed. City staff will no longer fill in incomplete information for the applicant.
- Two types of plot plans:
  - Non-engineered Plot Plans
  - Engineered Plot Plans



# Non-Engineered Plot Plan Requirements

- Non-engineered plot plans will not need to be signed and sealed by a design professional.
- Similar to current requirements except we want to see more info about the following:
  - Streets: pavement edge, sidewalk location, curb inlets
  - Driveways: location, width
  - Storm drainage and sanitary sewer structures
  - Elevations: ground contours or drainage arrows, elevation callouts for each property corner, sanitary or storm structures

# Engineered Plot Plan Requirements

For any of the following cases, an engineered plot plan is required:

- Lots with/next to an engineered drainage swale.
- Lots containing regulated floodplain.
- Lots with an earth retaining structure not shown on the approved site plans.
- Lots with building finished floor elevation or site grading that deviates from the approved grading plan.





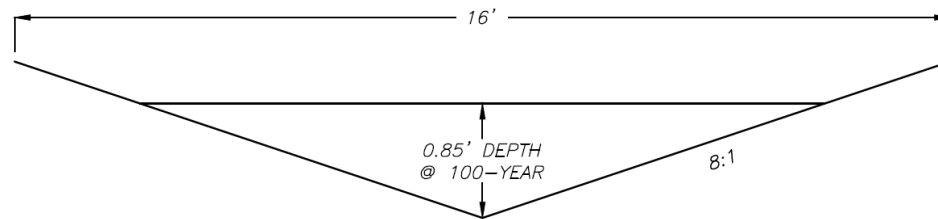
# Engineered Plot Plan Requirements

Engineered plot plans must be signed and sealed by a Missouri-registered Professional Engineer of Land Surveyor

# Engineered Plot Plan Requirements

For lots adjacent to or containing an engineered drainage swale:

- Location
- Proposed flowline elevations
- Dimensions (height, width, side slopes) or cross section, minimum grade
- 100-year storm water surface elevation

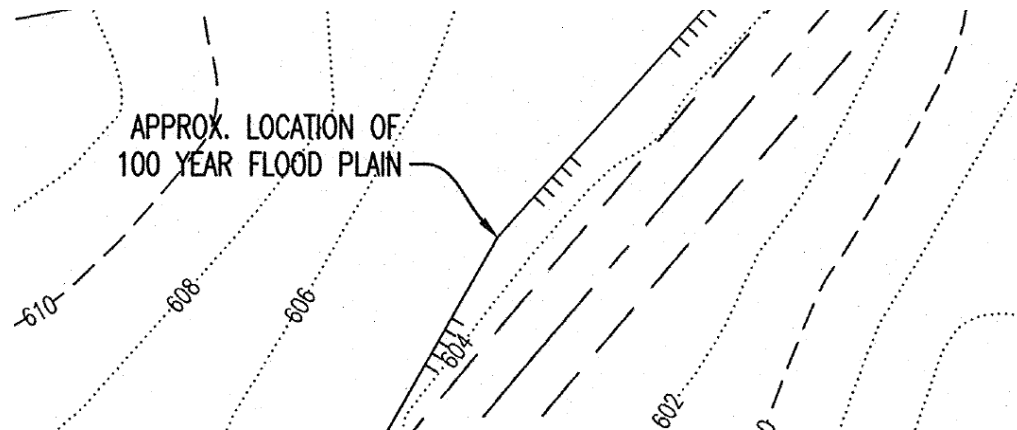


OVERFLOW SWALE  
SECTION

# Engineered Plot Plan Requirements

For lots containing regulated floodplain:

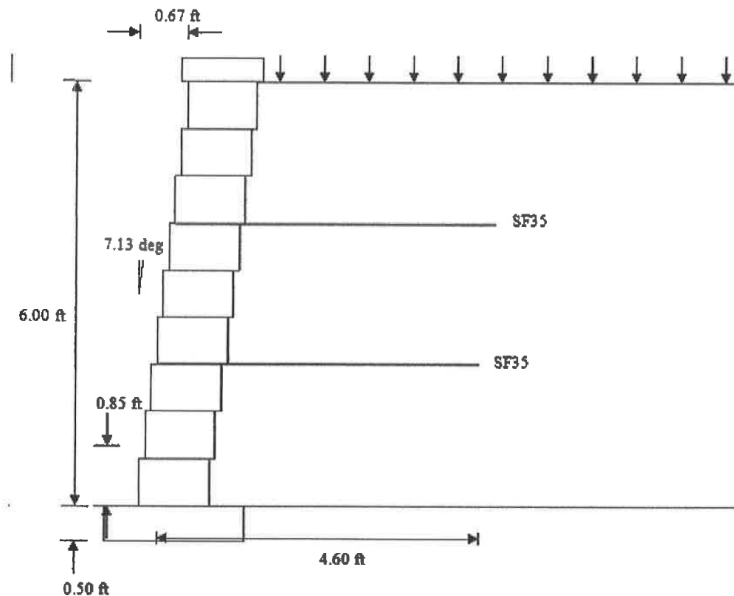
- Limit of regulated floodplain
- Plot plan must be accompanied by a completed flood plain development permit application.
- A FEMA Elevation Certificate must be submitted later, after the building is constructed, prior to issuance of a Certificate of Occupancy



# Engineered Plot Plan Requirements

For lots with an earth retaining structure not included on approved site plans:

- Location, type and maximum unbalanced grades



Retaining walls that are not laterally supported at the top must be designed to comply with International Residential Code requirements.

# Engineered Plot Plan Requirements

For lots with building finished floor elevation or site grading that deviates from that shown on the approved grading plan:

- A revised grading plan and a letter from the design civil engineer, stating that the changes will not cause adverse effects

# Feedback from Engineering Firms

We met with representatives from six local engineering firms on March 23, 2016 to discuss these changes. We presented our proposed requirements and asked for their input on these questions:

1. Given the problems with residential sites outlined in this presentation, are the proposed plot plan requirements reasonable? If not, how could the issues be addressed differently?
2. What is the additional cost to developers to meet these proposed requirements?

# Feedback from Engineering Firms

Q1: Given the problems with residential sites outlined in this presentation, are the proposed plot plan requirements reasonable? If not, how could the issues be addressed differently?

We received 2 responses:

- One firm said the proposed requirements are reasonable, and will result in a better product for home buyers.
- One firm said most are reasonable and they see the value in making the changes. However, they question whether developers and home builders will agree that these changes are necessary. They wondered if diligent and conscientious home builders, along with knowledgeable and timely inspections, would solve the problems rather than imposing additional plot plan requirements.

# Feedback from Engineering Firms

Q2: What is the additional cost to developers to meet these proposed plot plan requirements?

Based on the 2 responses received:

- Non-engineered Plot Plans additional cost will be on the order of \$100-\$200.
- If the builder places some features on the plot plans themselves, such as the building footprint, driveway locations, etc., cost can be saved. (These can be hand-drawn in but must be accurate and show dimensions, building setbacks, etc.)
- Engineered Plot Plans would cost more than non-engineered. (Additional cost on the order of \$700). Engineered plot plans should be completed entirely by the design professional and not left incomplete for the builder to complete.





# Feedback from HBA

We met with the Columbia Home Builders Association on April 14, 2016 to discuss these changes.

The HBA was generally supportive of the changes, stating that contractors should be more knowledgeable about site issues, and that City staff should not be adding information to plot plans.

# Plot Plan Checklist

Checklist for the new plot plan requirements can be picked up tonight.



CITY OF COLUMBIA, MISSOURI

COMMUNITY DEVELOPMENT

DEPARTMENT OF PLANNING AND DEVELOPMENT

(573) 874-7239  
BUILDING AND SITE DEVELOPMENT  
(573) 874-7474  
OFFICE OF NEIGHBORHOOD SERVICES  
(573) 817-5050

## Plot Plans for One & Two Family Residential Dwelling - Checklist

(Applies to lots within plans approved after October 1, 2016)

**Plot plans with incomplete information will not be processed.**

**Plot plans shall be submitted on 8 1/2 x 11 or 11 x 17 paper, and include the following:**

- ☐ Drawing scale (engineer or architect scale) and north arrow. "Not to Scale" is unacceptable.
- ☐ Title block:
  - ☐ Titled "Plot Plan"
  - ☐ Legal description of the lot (Plat name & number, recorded book & page, and lot number)
  - ☐ Property Address – street name only. Leave address number blank for City staff to fill in.
  - ☐ Date
- ☐ All property lines and right-of-way (ROW) lines with dimensions.
- ☐ All easement lines with dimensions.
- ☐ Building setback lines with dimensions.
- ☐ Dimensions and accurate depiction of all existing and proposed building/structure footprints, including decks and covered patios.
- ☐ Distances from existing and proposed structures to property boundaries (setbacks).
- ☐ Street centerline, ROW width labeled, edge of street pavement, and any curb/pavement radius.
- ☐ Sidewalks with width labeled.
- ☐ Curb inlets with top elevation callout.
- ☐ Driveway location showing drive approach, width labeled.
- ☐ Proposed low finished floor elevation and if applicable, main floor elevation.
- ☐ Label indicating "walkout" or "slab".
- ☐ Proposed ground elevation contours (1-foot interval), or drainage arrows (sufficient to clearly indicate how water will shed from all parts of the lot).
- ☐ Elevation callouts for each property corner, at a minimum.
- ☐ Top of curb elevation callouts at extension of property boundary on each side.
- ☐ Location and elevation callouts for all sewer manholes and storm structures on or adjacent to lot.
- ☐ Upstream sanitary sewer manhole cover elevation.
- ☐ Flood plain statement. If any part of the lot contains regulated floodplain, then an Engineered Plot plan is required, see below.

**Additional requirements may apply – see next page**

701 E. BROADWAY • P.O. BOX 6015 • COLUMBIA, MISSOURI 65205  
(573) 874-7239 • FAX (573) 874-7546 • TTY (573) 874-6364  
[www.GoColumbiaMo.com](http://www.GoColumbiaMo.com)

## **Engineered Plot Plans – Prepared by Professional Engineer or Land Surveyor**

For any of the following cases, an engineered plot plan is required:

- Lots adjacent to or containing an engineered drainage swale as shown on the approved site plans.
- Lots containing regulated floodplain as defined by City Ordinance 29-22.
- Lots with an earth retaining structure, unless said structure was included on approved site plans.
- Lots with building finished floor elevation or site grading that deviates from that shown on the approved grading plan


In addition to all previous requirements, engineered plot plans must include the following:

- ☐ Signature and seal of a Missouri registered Professional Engineer or Land Surveyor
- ☐ For lots adjacent to or containing an engineered drainage swale: Location, proposed flowline elevations, dimensions (height, width, side slopes) or cross section, minimum grade, and 100-year storm water surface elevation of the swale.
- ☐ For lots containing regulated floodplain: Limit of regulated floodplain. Plot plan must be accompanied by a completed flood plain development permit application. (Note: A FEMA Elevation Certificate must be submitted after the building is constructed, prior to issuance of a Certificate of Occupancy.)
- ☐ For lots with an earth retaining structure not included on approved site plans: Location, type and maximum unbalanced grades of any earth retaining structures on the lot. Retaining walls that are not laterally supported at the top must be designed to comply with International Residential Code requirements.
- ☐ For lots with building finished floor elevation or site grading that deviates from that shown on the approved grading plan, a letter and a revised grading plan is needed from the design civil engineer stating that this lot has been evaluated and the revised building elevation and/or grading will not cause any adverse effects to the overall site drainage and for the surrounding lots.



# Only Part of the Solution

- We realize that a better plot plan is only the first step to resolve some of the issues discussed.
- The next step will involve our inspection process, and how our Site Inspectors will verify the information in the field. We are experimenting with using laser levels to check elevations, etc.
- Street as-builts will be helpful to provide easily-accessed benchmarks for checking elevations.



# New Requirement for Residential Demolition Permits



# New Requirement for Residential Demolition Permits

- Effective October 1, 2016, residential demolition permit applications must include a Site Plan.
- Intended to ensure that requirements of Sec. R106.2 of the International Residential Code are met.
- Note that current City ordinance requires that all accessory structures and paved areas are to be removed at the time of demolition of the primary structure. Any variance from this requirement should be discussed at the time of application



# New Requirement for Residential Demolition Permits

## Site Plan requirements:

- Drawn to appropriate scale
- North arrow
- Property lines with dimensions
- Adjacent streets and easements
- Property address
- Outline of all structures and paved areas to remain or be demolished
- Distance between remaining buildings and between remaining buildings and property lines

# New Requirement for Residential Demolition Permits

A letter outlining these new requirements is available for pickup tonight.

## Notice Regarding Residential Demolition Permits

July 8, 2016

Effective October 1, 2016 residential demolition permit applications will be required to be accompanied by a site plan which includes the following:

1. Drawn to an appropriate scale.
2. Property lines with dimensions.
3. Adjacent streets and easements.
4. Property address.
5. North arrow.
6. Outline of all structures and paved areas to remain or be demolished.
7. Distance between remaining buildings and between remaining buildings and property lines.

These requirements are intended to ensure that residential demolitions meet the requirements of R106.2 of the 2015 International Residential Code which states as follows:

**“Site plan or plot plan...**In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.”

It should also be noted that current City ordinance requires that all accessory structures and paved areas are to be removed at the time of demolition of the primary structure. If project conditions warrant the need for a variance from this requirement it should be discussed at the time of application.

Questions about this notice should be directed to Doug Kenney, Senior Building Inspector at (573) 874-7474.

Sincerely,



Shane S. Creech, P.E.

Building and Site Development Manager

# Thank You

*Rick Kaufmann, P.E.*

*Engineer, Building & Site Development*

*City of Columbia Community Development Department*

*701 E. Broadway*

*P.O. Box 6015*

*Columbia, MO 65205-6015*

*[Rick.Kaufmann@CoMo.gov](mailto:Rick.Kaufmann@CoMo.gov)*

*Phone: (573) 874-7575*